



ISS Utilization Management Report

Red Team

June 12, 2002



We commend the Blue Team on their hard work, work that is critically important to the success of ISS and the Agency



Thanks for the Great Support !

Barbara Kreykenbohm

Ellen Stigberg

Michael Altus



Red Team I Charter

- Review for technical accuracy, completeness, and viability
 - Process: will this process result in adequate trades?
 - Products: appropriate level of detail, all necessary products?
 - schedule
 - forward action plan
- Informally review Red Team I findings with the Team and provide guidance on process, products, schedule and forward action plan
- Document (written) and present (oral) findings and recommendations to the OBPR Associate Administrator



Red Team I Membership

H / Harold Jefferson

M / Donna Shortz

B / Scott Black

S / Y / GSFC/ John Campbell PhD,

Dave Leckrone PhD

U / Eugene Trinh PhD, David Tomko PhD

ARC / Scott Hubbard PhD

GRC / Steve Simons

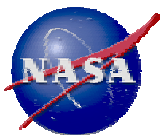
JSC/ Bill Gerstenmaier, Charles
Stegemoeller

KSC/ Maynette Smith, Randy Galloway

LaRC/ Roger Breckenridge PhD

MSFC/ Jan Davis PhD, William R. Hicks

SSC / Mark Mick

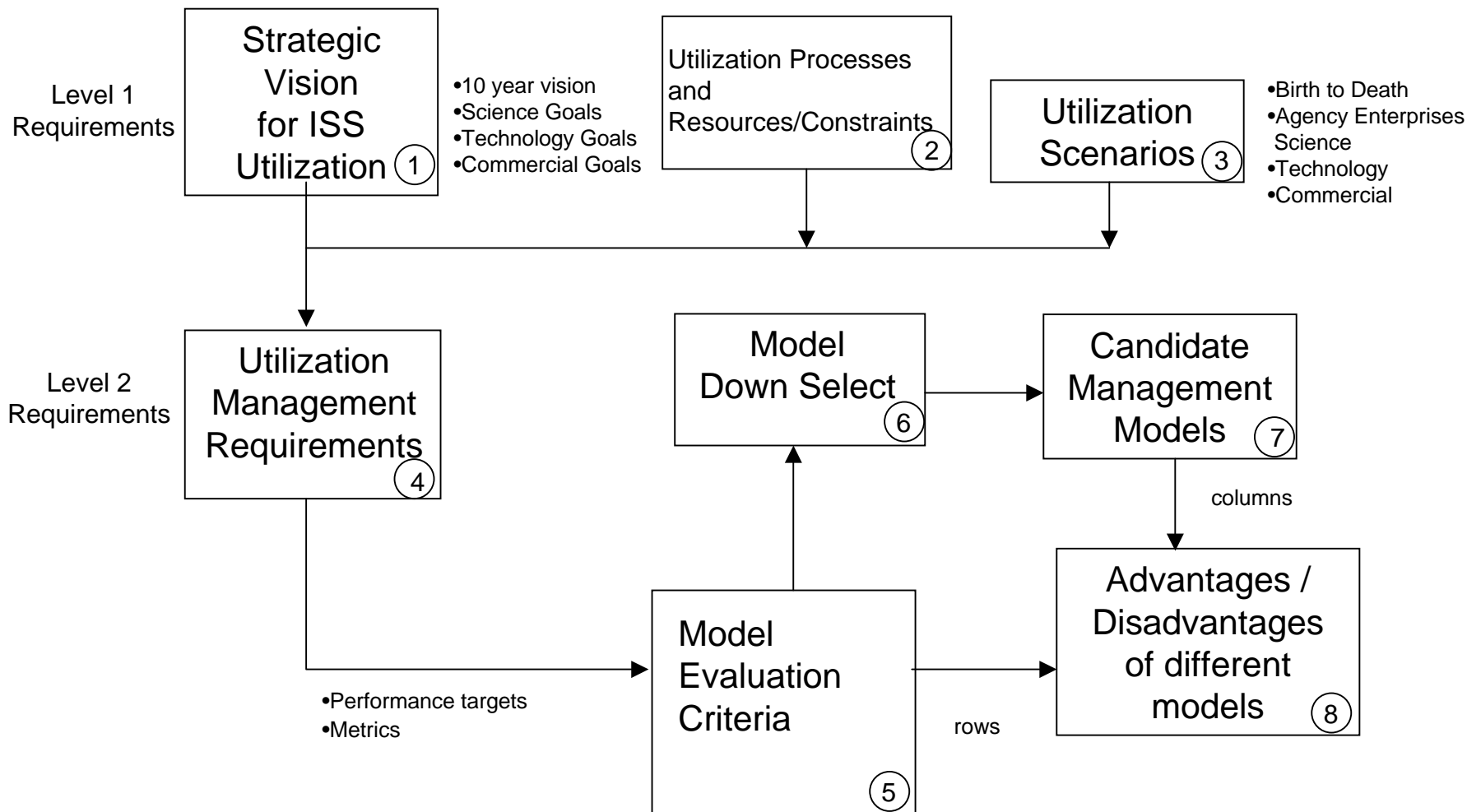


Process Recommendation

- We recommend a revised process as described in the following charts
- This is the Red Team definition of “Model”—a partitioning of the management functions necessary to conduct utilization on the ISS among NGOs and NASA. Hybrid constructions that include “appropriately governmental” rather than just “inherently governmental” functions as well as multiple NGOs are acceptable.



Process





Evaluation Matrix

Evaluation Matrix		Models (Steps 6 & 7)				
		Present	Model 1	Model 2	Model 3.1	Model 3.2
Performance Targets (Step 4.)						
	Advocacy					
	Great peer reviewed Science					
	Conduct 30 Fundamental Physics ...(example)					
	.					
	.					
	.					
Metrics (Step 4.)						
	Cycle Time					
	Number of Pis					
Areas for improvement (Step 5):						
	TBD					

SAMPLE
Step 5

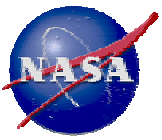


Step 1: Agency's Strategic Vision for ISS Utilization

Level I: Goals/Vision/Requirements:

Required: The Agency's strategic vision for ISS Utilization

- Must take into consideration uncertainties/drivers such as:
 - Agency Enterprises
 - Agency Scenarios
 - ISS Configuration and Evolution (e.g., number of racks, crew size, attachment points)
 - ReMaP
 - etc.
 - International Partner (IP) Relations
 - Goals of ISS in context of
 - Science
 - Technology
 - Commercial
 - Agency Advisory/Stakeholders Structure
 - Agency Priority Decision Tree/Authority
- Action: Distinguish/Evaluate Similarities/Differences of 3 (science, technology, commercial)
- Outcome: Performance Targets for evaluating Utilization Management Model



Step 2: Establish Utilization Processes and Resources/Constraints (Present state)

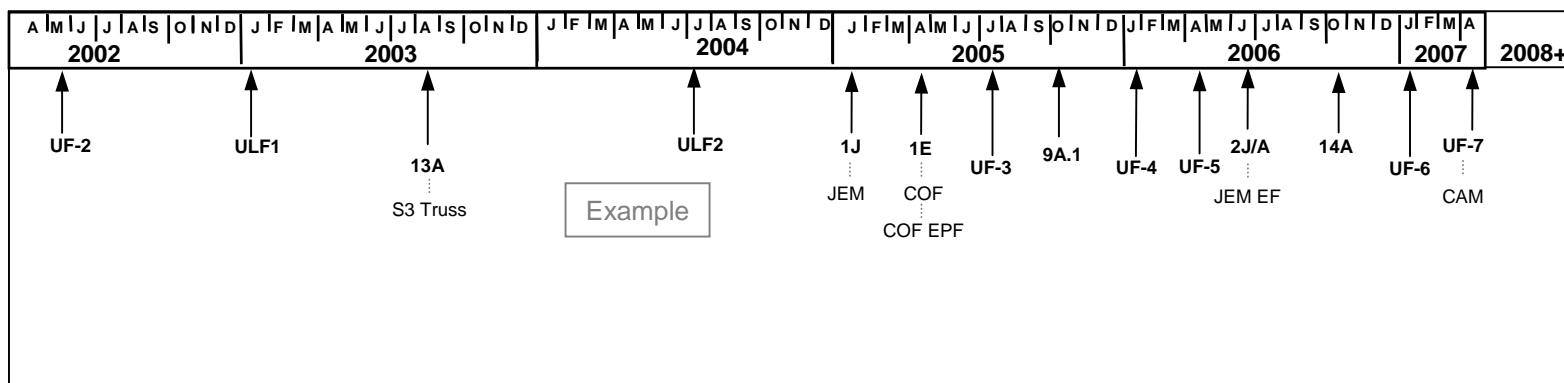
- Required:
 - Agency Policies/Procedures
 - Utilization Selection Processes (e.g. peer reviewed science)
 - International Partner Agreements
 - Intellectual Property (e.g. commercial)
 - 30/30/30/10 Resource Allocation Policy
 - Programmatic Resources/Constraints, e.g.,
 - Vehicle (STS, ISS, resupply, etc.) capabilities
 - ISS configuration
 - Budget
 - Infrastructure
 - Interdependencies with other NASA programs and institutional assets (people, facilities, etc.)
 - Schedules
 - Crew use
 - Research Priorities
- Action: Establish Utilization Processes/Drivers
 - Transaction Flow Diagrams (steps/procedures) [At one step lower level of detail than shown in “Top Level Flow ISS Utilization”]
 - End-to-end cycle time for classes of payloads



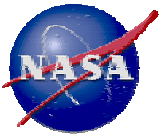
Step 3: Utilization Scenarios

- Outcome:

- **A)** Benchmark payload complexities that represent present and future requirement flows, e.g.:
 - Racks - STS -- ISS -- Operations
 - Middeck Lockers - STS -- ISS -- Ground
 - Attached Payloads - STS -- ISS -- Operations
 - Human experiments on IP modules using commercial equipment
- **B)** Establish scenarios of manifest and platform availability for payloads over time, e.g.:



- **C)** Characterize drivers of the 3 types of payloads (science, technology, commercial) considering the different Agency Enterprises to establish relationships to Management Model Support (e.g. Commercial Payload Rapid turnaround)



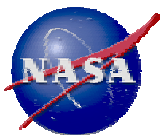
Step 4: Utilization Management Requirements

- Action: Develop utilization management requirements derived from Steps 1, 2, & 3
- Outcome: Rows of Advantages/Disadvantages matrix (at a level containing 10's of entries, not 100's)
 - Performance Targets
 - Metrics
- Sources:
 - Products of Steps 1, 2, & 3
 - Transaction Diagrams
 - Work Breakdown Structure (WBS)



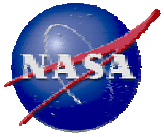
Step 5: Model Evaluation Criteria

- Performance targets (from Step 4.)
- Metrics (from Step 4.)
- Add to criteria: Areas of improvement based on present performance. Integrate/consolidate existing customer surveys for areas of improvement (at a level consistent with block 2). Use data sources such as: PPMR; POCAAS; SSUAS Advisory Group; PI and payload developer interviews
 - A. What is working very well?
 - B. What is working but can be improved?
 - C. What is broken?
 - What are the possible fixes?
- Evaluate the present state as the first column of the models in the matrix
- Develop relative weighting of criteria



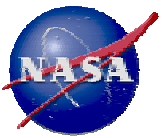
Step 6: Model Downselect

- Extend candidate models to include combinations of organizations
 - Consider different partitioning options between NASA and NGO functions
 - Instead of basing models on assigning functions alone, construct models with sufficient consideration of the effects on process flows to avoid adding complexity, excessive handoff points, and lack of accountability.
 - Are Multiple NGOs required (research vs commercial?)?
(zero, one, multiple)
- Considerations for NASA
 - Inherently governmental: legal, procurement, FAIR
 - Core Competencies
 - Appropriately governmental (safety, e.g.)
 - Management functions
 - Policy
 - Budget
 - Schedule and phasing of implementation
- Start with a broad range of models and downselect to a few



Step 7: Candidate Models

- Product of the downselect process
- Provide the columns for Advantages/Disadvantages matrix



Step 8: Advantages & Disadvantages

- Evaluate the models:
 - Complete the matrix
 - Where do we want to be vs where we are today?
 - How well does each fulfill the targets, metrics, and improvements?
 - Evaluation requires comparison to existing management structures and lessons learned from organizations such as Hubble, SOFIA, Astrobiology, national laboratories , etc as a forecasting tool
 - Model evaluations need to address the following types of performance based questions:
 - Adaptability to ISS configuration changes;
 - Ability to accommodate work in progress (flight investigations, significant development, etc);
 - Time Phasing implications of implementation of management model
 - Estimate ROM FTE, cost implications
- Produce a narrative of strengths and weaknesses for each model



Products

- We recommend the team focus on only those products required to complete the evaluation matrix.
 - Other products that have been developed should be useful in the procurement development process
- The products should only be at the level of detail needed.
 - For example, the WBS, inherently governmental and interface matrix are at a much greater level of detail than necessary



Schedule

- The lack of input at the strategic level and uncertainty in basic assumptions (crew time, priorities, etc.) make it nearly impossible to go forward with a definitive plan having a reasonable chance of being successful, in the short term. A possible solution is described in Appendix B.
- Schedule for the reviews by Red Teams is compressed and is not consistent with REMAP delay and distillation. Recommend revisit of schedule and products.
 - Present schedule for User's Conference seems inappropriate, too little time after ReMaP
 - Budget input regarding NGO should be delayed until after Blue Team evaluation is complete
- We do not recommend a Red Team II until much, much later in the process



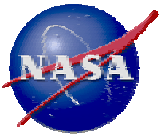
Observations

1. Focus to date is on NGO as “solution” (detailed WBS and emphasis on infrastructure resources). With re-scope of charter in March, the process to date did not step back and gather the larger view of Agency objectives and strategies for the ISS. Results in recommended process Steps 1-4.
2. Present state of ISS Utilization is not clearly understood – needed as benchmark for what corrective solutions are required and should be addressed in the Models.
3. Gap analysis has yet to be performed to identify areas for improvement.
4. Modeling as proposed by Blue Team has yet to establish “measures of success”. Potential to develop a tool without clear ability to determine success of the application.
5. Blue Team seemed to address engineering process instead of scientific process. For example, membership lacks representative active users.



Observations (Cont.)

6. Pay attention to the dynamic state of ISS and STS management concepts as they are under review and evaluation. Model for Utilization will be impacted by either platforms' approaches.
7. Consistently apply terminology, e.g., use "utilization" as the general term and "science", "technology", and "commercial" as the elements.
8. This Red Team should return to look at the final product.
9. Vision statement should be reviewed for completeness. Draw from other examples (see, e.g., the attached high level vision/rationale for HST Institute in Appendix A)
10. Advocacy needs to be given more visibility.
11. We remain convinced that the WBS model is too detailed for the purpose of the current blue team study.
12. Model evaluation should address internal barriers if they inhibit the successful implementation of a potential model.



Appendix A: HST Institute Guiding Principles

- **Long-term, consistent advocacy and support for long-term Hubble mission**
- **Best assurance of scientific excellence of HST mission, achieving the full potential of this very valuable resource**
- **Responsive to community desire for maximum community control, unencumbered by Federal bureaucracy**
- **Strong scientific leadership with ability to exercise independent judgment and to take scientific risks**
- **First-rate scientific institution able to attract and retain first-rate staff, conducive to overall program excellence**



Appendix B: Suggested Blue Team Follow-on

- To recommend to Congress in September that NASA proceed with a Phase A or advanced concept studies set of contracts, based on the final set of models from Blue Team.
 - These contracts could serve the purpose of refining how an NGO would work and it would identify what organizations have an interest in stepping up to the task.
 - This approach would maximize use of the blue team's products to date and should include the evaluation of several different models and a range of basic resource assumptions (e.g., crew time, station configuration, priorities).
 - The contracts should also ask bidders for their projection of costs, implementation phasing, and skill requirements.
 - Prospective bidders would likely indicate their relative preference for one model or another in this process, which would also be valuable input. We might also find sensitivities to basic resource assumptions out of this.
- Decision points to proceed beyond this phase could be built into the plan after completion of the contracts and evaluation of the products generated.
- A NASA team should prepare a case for the 'current state plus improvements' to make a complete input to the decision process.
- While the contracting process goes forward, some of the basic strategic level visions, requirements, priorities, and resource issues can be refined and made clear enough to feed into meaningful decision making when that point comes. The inputs from the prospective bidders relating to costs, schedules for implementation, and required skills would also benefit the decision process